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Salt Stress Induced Biosynthesis of Binase II, the Second Bacillus pumilus 7P Ribonuclease with Therapeutic Potential

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Abstract

© 2016, Springer Science+Business Media New York.Besides the dominant well-studied low-molecular weight ribonuclease (RNase) binase I, Bacillus pumilus secretes a high-molecular weight binase II which differs from binase I by the absence of substrate specificity and the mode of RNA cleavage. Similar to many other RNases, binase II was proposed to have therapeutic potential. Deciphering molecular mechanisms of binase II biosynthesis regulation is required to boost expression of this RNase. Here, we have shown that increase of salinity in growth medium leads to elevated biosynthesis level of binase II. We detected in the binase II promoter the gene sequences homologous to the recognition sites of response regulator DegU. DegS-DegU signal transduction system is stimulated by high salt concentrations. Using the Bacillus subtilis strains with various mutations in DegU gene, we have shown that the DegS-DegU system is responsible for the increase of binase II gene expression under salt stress, indeed.

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Keywords

Bacillus pumilus, Biosynthesis activation, Ribonuclease binase II, Salt stress

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